V. *An Attempt to explain the* Phænomenon *of the* horizontal Moon *appearing bigger, than when elevated many Degrees ab ve the* Horizon: *Supported by an* Experiment. *By the Rev.* J. T. Deſaguiliers, *LL. D. F. R. S.* *Communicated* Jan. 30, 1734-5.

THIS apparent Increaſe of the Moon's Diameter (which a Teleſcope with a Micrometer ſhews to be only apparent) is owing to the following early Prejudice, which we have imbib'd from Children.

When we look at the Sky towards the Zenith, we imagine it to be much nearer to us, than when we look at it towards the Horizon; ſo that it does not appear Spherical, according to the vertical Section E F G H I, (Fig. 4.) but Elliptical, according to the Section e F g h i. For this I appeal to every body's Senſe of ſeeing; but not to their Reaſon, which is apt to take off the Prejudice in Perſons that have ſome Knowledge of Aſtronomy. Whereas any other Perſon looking up very high towards the Sky, and then forwards near the Horizon, will (when asked) ſay that the Sky over his Head appears much nearer. The Sky thus ſeen, ſtrikes the Eye in the ſame Manner as the long arch'd Roof of the Ile of a Cathedral Church, or the Cieling of a long Room.

This being premiſed, let us conſider the Eye at C, upon the Surface of the Earth, and imagine C at the Surface to coincide with K at the Centre; to avoid taking into Conſideration that the Moon is really farther

ther from the Eye when in the Horizon, than when it is ſome Degrees high. Now when the Moon is at G, we conſider it as at g, not much farther than G; but when it is at H, we imagine it to be at h, almoſt as far again. Therefore, while it ſubtends the ſame Angle as it did before (nearly), we imagine it to be ſo much bigger as the Diſtance ſeems to us to be encreaſed.

I have contriv'd the following Experiment to illuſtrate this: Fig. 5.

I took two Candles of equal Height and Bigneſs A B, C D, and having plac'd A B at the Diſtance of ſix or eight Feet from the Eye, I placed C D at double that Diſtance; then cauſing any unprejudic'd Perſon to look at the Candles, I ask'd which was biggeſt? and the Spectator ſaid they were both of a Bigneſs; and that they appear'd ſo, becauſe he allow'd for the greater Diſtance of C D; and this alſo appear'd to him, when he look'd thro' a ſmall Hole. Then deſiring him to ſhut his Eyes for a Time, I took away the Candle C D, and plac'd the Candle E F cloſe by the Candle A B, and tho' it was as ſhort again as the others, and as little again in Diameter, the Spectator, when he open'd his Eyes, thought he ſaw the ſame Candles as before. Whence it is to be concluded, that when an Object is thought to be twice as far from the Eye as it was before, we think it to be twice as big, tho' it ſubtends but the ſame Angle.——And this is the Caſe of the Moon, which appears to us as big again, when we ſuppoſe it as far again, tho' it ſubtends but the ſame Angle.

The Difference of Diſtance of the Moon in *Perigeo* and *Apogeo*, will account for the different

Bigneſs of the Horizontal Moon at different Times, adding alſo the Conſideration of the Faintneſs which Vapours ſometimes throw on the Appearance.

VI. *An* Explication *of the* Experiment *made in* May 1735, *as a farther Confirmation of what was ſaid in a Paper given in* January 30, 1734-5. *to account for the Appearance of the* horizontal Moon *ſeeming larger than when higher. By the Same.*

HAVING made an Experiment with three Ivory Balls for Confirmation of what I had advanced, namely, that the Deception ariſes from our judging the *horizontal Moon* to be much farther than it is; ſome Gentlemen of the Society were convinced by the Experiment, but others were not; which obliges me to give this further Account of it, that People may judge of the Thing in Writing, which could not be ſo well attended to in the Hurry of ſeveral Perſons viewing the Experiment in Haſte.

1. Two equal Ivory Balls were ſet one beyond another in reſpect of the Eye at E, namely, A B at 20 Feet Diſtance from the Eye, and C D at 40.

2. It is certain, by the Rules of Optics, that the Eye at E or F will ſee the Ball C D under an Angle but half as big as it ſees the Ball A B; that is, that the Ball C D muſt appear no bigger than the Ball o p placed by the Side of A B.

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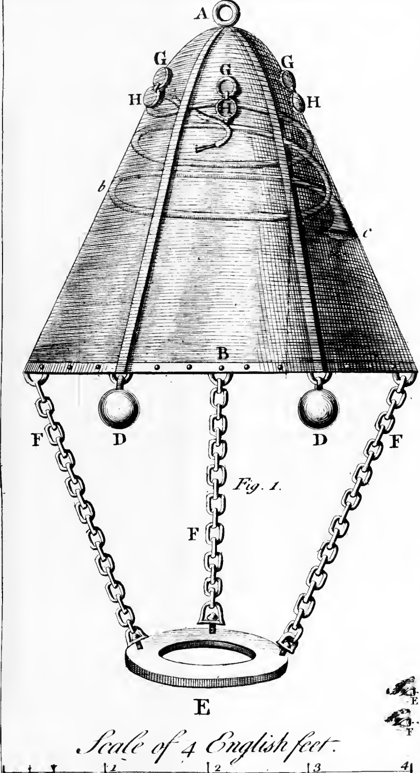

Fig. 1.

Scale of 4 English feet.

Fig. 2.

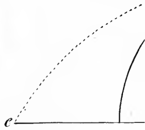

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Fig. 6

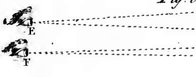


Fig. 2.

Fig. 3

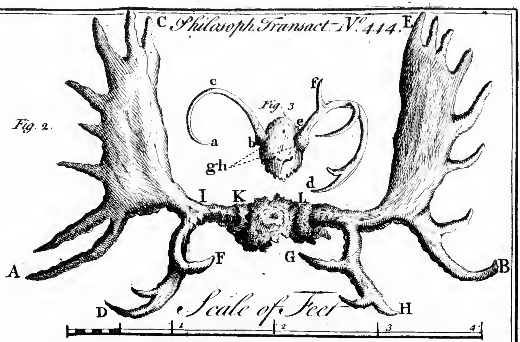


Fig. 4.

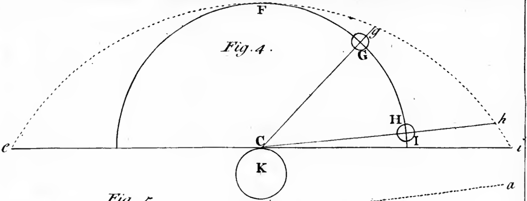


Fig. 5.

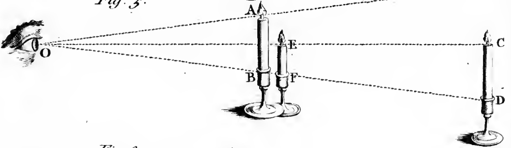
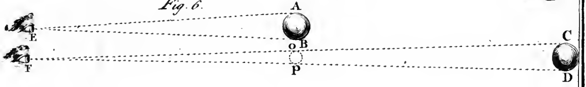


Fig. 6.



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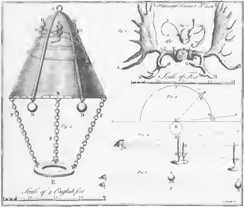
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